

## **APPENDIX F-1.**

### **Dependent Variable-Covariate Associations for the Neoplasia Assessment and Re-Analysis of Table 10-14**

This appendix contains results of tests of association between each dependent variable and candidate covariates for the adjusted analysis. Pearson's chi-square test (continuity-adjusted for  $2 \times 2$  tables) is used for significance testing of the associations between each discrete dependent variable and the candidate covariate. When a candidate covariate is continuous in nature (for example, age), the covariate is discretized prior to the analysis of the discrete dependent variable. Pearson's correlation coefficient is used for significance testing of the associations between the natural logarithm of prostate-specific antigen in its continuous form and a continuous candidate covariate. When a candidate covariate is discrete in nature, means transformed from the natural logarithm scale to the original scale are presented, and an analysis of variance is used to investigate the difference between the means on the natural logarithm scale.

Also included in this appendix is a re-analysis of Table 10-14, which showed results of the variable melanoma with a participant miscoded. After the analyses were well underway, an error in the classification of one participant's race was discovered. He was listed in the data base as Black, when he was actually non-Black. The participant was a 50-year-old enlisted flyer Comparison, with a current serum dioxin value < 10 ppt. This participant had a melanoma and was excluded from the analyses of melanomas because he was erroneously coded as Black. Appendix Table F-1-2 shows results of additional analyses of melanomas performed with this participant properly coded as non-Black. These results did not indicate any change in conclusions based on this misclassification.

**Table F-1-1.**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

<b>Dependent Variable</b>	<b>Level</b>	<b>Age</b>			<b>Race</b>		
		<b>Born ≥1942</b>	<b>Born &lt;1942</b>	<b>p-Value</b>	<b>Black</b>	<b>Non-Black</b>	<b>p-Value</b>
Any Skin Neoplasm	Yes	(n=881) 25.3%	(n=1,203) 32.8%	<0.001	--	--	--
Malignant Skin Neoplasm	Yes	(n=881) 7.6%	(n=1,203) 16.3%	<0.001	--	--	--
Benign Skin Neoplasm	Yes	(n=951) 18.5%	(n=1,263) 18.5%	0.999	(n=130) 18.5%	(n=2,084) 18.5%	0.999
Skin Neoplasm of Uncertain Behavior or Unspecified Nature	Yes	(n=881) 0.5%	(n=1,203) 0.6%	0.927	--	--	--
Any Basal Cell Carcinoma	Yes	(n=881) 6.0%	(n=1,203) 14.1%	<0.001	--	--	--
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck	Yes	(n=881) 4.2%	(n=1,203) 11.5%	<0.001	--	--	--
Basal Cell Carcinoma on Trunk	Yes	(n=881) 1.9%	(n=1,203) 4.2%	0.007	--	--	--
Basal Cell Carcinoma on Upper Extremities	Yes	(n=881) 0.8%	(n=1,203) 2.5%	0.006	--	--	--
Basal Cell Carcinoma on Lower Extremities	Yes	(n=881) 0.1%	(n=1,203) 0.3%	0.847	--	--	--
Squamous Cell Carcinoma	Yes	(n=881) 0.8%	(n=1,203) 1.6%	0.163	--	--	--
Nonmelanoma	Yes	(n=881) 6.7%	(n=1,203) 15.6%	<0.001	--	--	--
Melanoma	Yes	(n=881) 1.0%	(n=1,203) 1.0%	0.999	--	--	--
Any Systemic Neoplasm	Yes	(n=954) 14.1%	(n=1,269) 25.8%	<0.001	(n=130) 21.5%	(n=2,093) 20.7%	0.904
Malignant Systemic Neoplasm	Yes	(n=954) 1.5%	(n=1,269) 6.9%	<0.001	(n=130) 3.9%	(n=2,093) 4.6%	0.841
Benign Systemic Neoplasm	Yes	(n=954) 12.0%	(n=1,269) 18.9%	<0.001	(n=130) 17.7%	(n=2,093) 15.8%	0.657
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature	Yes	(n=954) 1.2%	(n=1,269) 2.1%	0.142	(n=130) 0.8%	(n=2,093) 1.7%	0.639
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck	Yes	(n=954) 0.3%	(n=1,269) 1.3%	0.021	(n=130) 0.8%	(n=2,093) 0.9%	0.999
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx	Yes	(n=954) 0.1%	(n=1,269) 0.7%	0.074	(n=130) 0.8%	(n=2,093) 0.4%	0.999

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Occupation			p-Value
		Officer	Enlisted Flyer	Enlisted Groundcrew	
Any Skin Neoplasm	Yes	(n=847) 33.4 %	(n=337) 28.5 %	(n=900) 26.4 %	0.005
Malignant Skin Neoplasm	Yes	(n=847) 16.7 %	(n=337) 13.4 %	(n=900) 8.6 %	<0.001
Benign Skin Neoplasm	Yes	(n=860) 19.1 %	(n=362) 16.0 %	(n=992) 18.9 %	0.419
Skin Neoplasm of Uncertain Behavior or Unspecified Nature	Yes	(n=847) 0.6 %	(n=337) 0.0 %	(n=900) 0.7 %	0.336
Any Basal Cell Carcinoma	Yes	(n=847) 13.8 %	(n=337) 12.2 %	(n=900) 7.1 %	<0.001
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck	Yes	(n=847) 10.5 %	(n=337) 10.1 %	(n=900) 5.8 %	0.001
Basal Cell Carcinoma on Trunk	Yes	(n=847) 5.1 %	(n=337) 3.0 %	(n=900) 1.6 %	<0.001
Basal Cell Carcinoma on Upper Extremities	Yes	(n=847) 3.1 %	(n=337) 0.6 %	(n=900) 1.0 %	0.001
Basal Cell Carcinoma on Lower Extremities	Yes	(n=847) 0.2 %	(n=337) 0.0 %	(n=900) 0.2 %	0.678
Squamous Cell Carcinoma	Yes	(n=847) 1.8 %	(n=337) 1.2 %	(n=900) 0.8 %	0.173
Nonmelanoma	Yes	(n=847) 15.6 %	(n=337) 13.4 %	(n=900) 7.8 %	<0.001
Melanoma	Yes	(n=847) 1.3 %	(n=337) 0.0 %	(n=900) 1.1 %	0.120
Any Systemic Neoplasm	Yes	(n=863) 22.3 %	(n=363) 23.1 %	(n=997) 18.6 %	0.069
Malignant Systemic Neoplasm	Yes	(n=863) 6.3 %	(n=363) 6.6 %	(n=997) 2.4 %	<0.001
Benign Systemic Neoplasm	Yes	(n=863) 15.3 %	(n=363) 18.2 %	(n=997) 15.7 %	0.429
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature	Yes	(n=863) 2.4 %	(n=363) 0.6 %	(n=997) 1.4 %	0.043
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck	Yes	(n=863) 0.9 %	(n=363) 1.7 %	(n=997) 0.6 %	0.191
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx	Yes	(n=863) 0.4 %	(n=363) 1.1 %	(n=997) 0.3 %	0.126

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Skin Color <sup>a</sup>			Hair Color		
		Non-Peach	Peach	p-Value	Black or Dark Brown	Other <sup>b</sup>	p-Value
Any Skin Neoplasm	Yes	(n=433)	(n=1,646)		(n=1,427)	(n=653)	
		24.5%	30.9%	0.011	28.3%	32.3%	0.071
Malignant Skin Neoplasm	Yes	(n=433)	(n=1,646)		(n=1,427)	(n=653)	
		9.7%	13.4%	0.050	11.7%	14.6%	0.081
Benign Skin Neoplasm	Yes	(n=553)	(n=1,655)		(n=1,550)	(n=659)	
		16.8%	19.0%	0.285	18.2%	19.1%	0.650
Skin Neoplasm of Uncertain Behavior or Unspecified Nature	Yes	(n=433)	(n=1,646)		(n=1,427)	(n=653)	
		0.7%	0.5%	0.876	0.5%	0.6%	0.976
Any Basal Cell Carcinoma	Yes	(n=433)	(n=1,646)		(n=1,427)	(n=653)	
		8.3%	11.3%	0.089	9.9%	12.4%	0.098
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck	Yes	(n=433)	(n=1,646)		(n=1,427)	(n=653)	
		6.9%	8.8%	0.247	7.3%	10.9%	0.008
Basal Cell Carcinoma on Trunk	Yes	(n=433)	(n=1,646)		(n=1,427)	(n=653)	
		2.1%	3.5%	0.173	3.2%	3.4%	0.901
Basal Cell Carcinoma on Upper Extremities	Yes	(n=433)	(n=1,646)		(n=1,427)	(n=653)	
		1.2%	1.9%	0.367	1.5%	2.3%	0.303
Basal Cell Carcinoma on Lower Extremities	Yes	(n=433)	(n=1,646)		(n=1,427)	(n=653)	
		0.2%	0.2%	0.999	0.1%	0.3%	0.792
Squamous Cell Carcinoma	Yes	(n=433)	(n=1,646)		(n=1,427)	(n=653)	
		0.7%	1.4%	0.352	1.1%	1.5%	0.570
Nonmelanoma	Yes	(n=433)	(n=1,646)		(n=1,427)	(n=653)	
		8.8%	12.7%	0.031	10.9%	14.1%	0.042
Melanoma	Yes	(n=433)	(n=1,646)		(n=1,427)	(n=653)	
		0.9%	1.0%	0.999	1.1%	0.8%	0.706
Any Systemic Neoplasm	--	--	--	--	--	--	--
Malignant Systemic Neoplasm	--	--	--	--	--	--	--
Benign Systemic Neoplasm	--	--	--	--	--	--	--
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx	--	--	--	--	--	--	--

<sup>a</sup> Non-Peach = Dark, medium, or pale skin.

Peach = Dark peach or pale peach skin.

<sup>b</sup> Other = Bald, light brown, blonde, or red hair.

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

<b>Dependent Variable</b>	<b>Level</b>	<b>Eye Color</b>			<b>p-Value</b>
		<b>Brown</b>	<b>Hazel or Green</b>	<b>Gray or Blue</b>	
Any Skin Neoplasm	Yes	(n=619)	(n=562)	(n=897)	
		27.0%	31.0%	30.4%	0.242
Malignant Skin Neoplasm	Yes	(n=619)	(n=562)	(n=897)	
		10.8%	12.5%	13.8%	0.222
Benign Skin Neoplasm	Yes	(n=742)	(n=566)	(n=898)	
		17.9%	20.0%	18.0%	0.579
Skin Neoplasm of Uncertain Behavior or Unspecified Nature	Yes	(n=619)	(n=562)	(n=897)	
		1.0%	0.5%	0.2%	0.144
Any Basal Cell Carcinoma	Yes	(n=619)	(n=562)	(n=897)	
		8.9%	11.4%	11.5%	0.224
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck	Yes	(n=619)	(n=562)	(n=897)	
		7.3%	8.7%	9.0%	0.458
Basal Cell Carcinoma on Trunk	Yes	(n=619)	(n=562)	(n=897)	
		2.3%	4.1%	3.3%	0.198
Basal Cell Carcinoma on Upper Extremities	Yes	(n=619)	(n=562)	(n=897)	
		0.8%	2.5%	2.0%	0.073
Basal Cell Carcinoma on Lower Extremities	Yes	(n=619)	(n=562)	(n=897)	
		0.2%	0.2%	0.2%	0.961
Squamous Cell Carcinoma	Yes	(n=619)	(n=562)	(n=897)	
		0.8%	0.9%	1.8%	0.162
Nonmelanoma	Yes	(n=619)	(n=562)	(n=897)	
		10.0%	12.1%	12.9%	0.219
Melanoma	Yes	(n=619)	(n=562)	(n=897)	
		1.0%	0.7%	1.1%	0.745
Any Systemic Neoplasm	--	--	--	--	--
Malignant Systemic Neoplasm	--	--	--	--	--
Benign Systemic Neoplasm	--	--	--	--	--
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature	--	--	--	--	--
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck	--	--	--	--	--
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx	--	--	--	--	--

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Skin Reaction to Sun after at Least 2 Hours Exposure				p-Value
		No Reaction	Becomes Red	Burns	Painfully Burns	
Any Skin Neoplasm	Yes	(n=800)	(n=832)	(n=301)	(n=147)	<0.001
		24.3 %	32.8 %	32.2 %	35.4 %	
Malignant Skin Neoplasm	Yes	(n=800)	(n=832)	(n=301)	(n=147)	<0.001
		7.6 %	15.0 %	16.3 %	19.1 %	
Benign Skin Neoplasm	Yes	(n=905)	(n=846)	(n=310)	(n=148)	0.773
		17.6 %	19.4 %	18.1 %	19.6 %	
Skin Neoplasm of Uncertain Behavior or Unspecified Nature	Yes	(n=800)	(n=832)	(n=301)	(n=147)	0.786
		0.6 %	0.5 %	0.7 %	0.0 %	
Any Basal Cell Carcinoma	Yes	(n=800)	(n=832)	(n=301)	(n=147)	<0.001
		5.6 %	13.6 %	13.6 %	15.7 %	
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck	Yes	(n=800)	(n=832)	(n=301)	(n=147)	<0.001
		4.3 %	10.3 %	11.0 %	15.0 %	
Basal Cell Carcinoma on Trunk	Yes	(n=800)	(n=832)	(n=301)	(n=147)	0.002
		1.4 %	4.5 %	4.7 %	3.4 %	
Basal Cell Carcinoma on Upper Extremities	Yes	(n=800)	(n=832)	(n=301)	(n=147)	0.093
		0.9 %	2.4 %	2.0 %	2.7 %	
Basal Cell Carcinoma on Lower Extremities	Yes	(n=800)	(n=832)	(n=301)	(n=147)	0.777
		0.3 %	0.2 %	0.0 %	0.0 %	
Squamous Cell Carcinoma	Yes	(n=800)	(n=832)	(n=301)	(n=147)	0.389
		0.9 %	1.2 %	2.0 %	2.0 %	
Nonmelanoma	Yes	(n=800)	(n=832)	(n=301)	(n=147)	<0.001
		6.8 %	14.4 %	15.6 %	17.7 %	
Melanoma	Yes	(n=800)	(n=832)	(n=301)	(n=147)	0.141
		0.9 %	0.7 %	1.3 %	2.7 %	
Any Systemic Neoplasm	--	--	--	--	--	--
Malignant Systemic Neoplasm	--	--	--	--	--	--
Benign Systemic Neoplasm	--	--	--	--	--	--
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature	--	--	--	--	--	--
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck	--	--	--	--	--	--
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx	--	--	--	--	--	--

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Skin Reaction to Sun after Repeated Exposures				p-Value
		Deeply Tanned	Moderately Tanned	Mildly Tanned	Freckled-No Tan	
Any Skin Neoplasm	Yes	(n=601) 25.5 %	(n=1,070) 30.3 %	(n=358) 33.2 %	(n=44) 40.9 %	0.017
Malignant Skin Neoplasm	Yes	(n=601) 7.8 %	(n=1,070) 13.1 %	(n=358) 16.5 %	(n=44) 36.4 %	<0.001
Benign Skin Neoplasm	Yes	(n=672) 17.9 %	(n=1,112) 19.4 %	(n=367) 18.5 %	(n=46) 6.5 %	0.159
Skin Neoplasm of Uncertain Behavior or Unspecified Nature	Yes	(n=601) 1.2 %	(n=1,070) 0.1 %	(n=358) 0.3 %	(n=44) 2.3 %	0.006
Any Basal Cell Carcinoma	Yes	(n=601) 6.5 %	(n=1,070) 10.9 %	(n=358) 14.3 %	(n=44) 31.8 %	<0.001
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck	Yes	(n=601) 5.5 %	(n=1,070) 8.3 %	(n=358) 10.6 %	(n=44) 31.8 %	<0.001
Basal Cell Carcinoma on Trunk	Yes	(n=601) 1.2 %	(n=1,070) 3.7 %	(n=358) 4.8 %	(n=44) 6.8 %	0.004
Basal Cell Carcinoma on Upper Extremities	Yes	(n=601) 0.5 %	(n=1,070) 2.0 %	(n=358) 3.1 %	(n=44) 4.6 %	0.011
Basal Cell Carcinoma on Lower Extremities	Yes	(n=601) 0.5 %	(n=1,070) 0.0 %	(n=358) 0.3 %	(n=44) 0.0 %	0.156
Squamous Cell Carcinoma	Yes	(n=601) 0.5 %	(n=1,070) 1.5 %	(n=358) 1.4 %	(n=44) 4.6 %	0.067
Nonmelanoma	Yes	(n=601) 7.2 %	(n=1,070) 12.3 %	(n=358) 15.6 %	(n=44) 34.1 %	<0.001
Melanoma	Yes	(n=601) 0.7 %	(n=1,070) 1.1 %	(n=358) 1.1 %	(n=44) 2.3 %	0.663
Any Systemic Neoplasm	--	--	--	--	--	--
Malignant Systemic Neoplasm	--	--	--	--	--	--
Benign Systemic Neoplasm	--	--	--	--	--	--
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature	--	--	--	--	--	--
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck	--	--	--	--	--	--
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx	--	--	--	--	--	--

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

<b>Dependent Variable</b>	<b>Level</b>	<b>Composite Sun Reaction Index<sup>c</sup></b>			<b>p-Value</b>
		<b>Low</b>	<b>Medium</b>	<b>High</b>	
Any Skin Neoplasm	Yes	(n=1,451)	(n=461)	(n=169)	0.071
		28.5%	30.8%	36.7%	
Malignant Skin Neoplasm	Yes	(n=1,451)	(n=461)	(n=169)	<0.001
		10.5%	15.8%	21.9%	
Benign Skin Neoplasm	Yes	(n=1,561)	(n=477)	(n=172)	0.594
		19.0%	17.0%	18.0%	
Skin Neoplasm of Uncertain Behavior or Unspecified Nature	Yes	(n=1,451)	(n=461)	(n=169)	0.578
		0.6%	0.2%	0.6%	
Any Basal Cell Carcinoma	Yes	(n=1,451)	(n=461)	(n=169)	<0.001
		8.8%	13.5%	18.9%	
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck	Yes	(n=1,451)	(n=461)	(n=169)	<0.001
		7.0%	9.3%	18.3%	
Basal Cell Carcinoma on Trunk	Yes	(n=1,451)	(n=461)	(n=169)	0.018
		2.6%	5.2%	3.6%	
Basal Cell Carcinoma on Upper Extremities	Yes	(n=1,451)	(n=461)	(n=169)	0.049
		1.3%	2.8%	3.0%	
Basal Cell Carcinoma on Lower Extremities	Yes	(n=1,451)	(n=461)	(n=169)	0.837
		0.2%	0.2%	0.0%	
Squamous Cell Carcinoma	Yes	(n=1,451)	(n=461)	(n=169)	0.204
		1.0%	2.0%	1.8%	
Nonmelanoma	Yes	(n=1,451)	(n=461)	(n=169)	<0.001
		9.8%	15.2%	20.7%	
Melanoma	Yes	(n=1,451)	(n=461)	(n=169)	0.163
		0.8%	1.1%	2.4%	
Any Systemic Neoplasm	--	--	--	--	--
Malignant Systemic Neoplasm	--	--	--	--	--
Benign Systemic Neoplasm	--	--	--	--	--
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature	--	--	--	--	--
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck	--	--	--	--	--
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx	--	--	--	--	--

<sup>c</sup> Low = Painfully burns after at least 2 hours exposure or freckles with no tan after repeated exposures.

Medium = Burns after at least 2 hours exposure or mildly tans after repeated exposures.

High = All other reactions.

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Average Lifetime Residential Latitude			Asbestos Exposure		
		<37°	≥37°	p-Value	No	Yes	p-Value
Any Skin Neoplasm		(n=1,004)	(n=1,058)		(n=1,522)	(n=562)	
	Yes	31.7%	28.0%	0.074	29.7%	29.4%	0.923
Malignant Skin Neoplasm		(n=1,004)	(n=1,058)		(n=1,522)	(n=562)	
	Yes	15.2%	10.3%	0.001	13.3%	10.7%	0.121
Benign Skin Neoplasm		(n=1,083)	(n=1,108)		(n=1,602)	(n=612)	
	Yes	17.7%	19.3%	0.368	18.1%	19.4%	0.505
Skin Neoplasm of Uncertain Behavior or Unspecified Nature		(n=1,004)	(n=1,058)		(n=1,522)	(n=562)	
	Yes	0.7%	0.4%	0.489	0.4%	0.9%	0.296
Any Basal Cell Carcinoma		(n=1,004)	(n=1,058)		(n=1,522)	(n=562)	
	Yes	13.5%	8.1%	<0.001	11.2%	9.3%	0.238
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck		(n=1,004)	(n=1,058)		(n=1,522)	(n=562)	
	Yes	10.9%	6.1%	<0.001	8.6%	7.8%	0.632
Basal Cell Carcinoma on Trunk		(n=1,004)	(n=1,058)		(n=1,522)	(n=562)	
	Yes	4.2%	2.3%	0.019	3.8%	1.8%	0.034
Basal Cell Carcinoma on Upper Extremities		(n=1,004)	(n=1,058)		(n=1,522)	(n=562)	
	Yes	2.3%	1.3%	0.137	2.1%	0.9%	0.094
Basal Cell Carcinoma on Lower Extremities		(n=1,004)	(n=1,058)		(n=1,522)	(n=562)	
	Yes	0.1%	0.3%	0.654	0.1%	0.4%	0.635
Squamous Cell Carcinoma		(n=1,004)	(n=1,058)		(n=1,522)	(n=562)	
	Yes	1.7%	0.9%	0.129	1.5%	0.7%	0.264
Nonmelanoma		(n=1,004)	(n=1,058)		(n=1,522)	(n=562)	
	Yes	14.9%	9.1%	<0.001	12.6%	9.8%	0.090
Melanoma		(n=1,004)	(n=1,058)		(n=1,522)	(n=562)	
	Yes	0.6%	1.4%	0.102	1.1%	0.9%	0.936
Any Systemic Neoplasm		--	--	--	(n=1,607)	(n=616)	
	Yes				20.9%	20.3%	0.748
Malignant Systemic Neoplasm		--	--	--	(n=1,607)	(n=616)	
	Yes				4.8%	4.1%	0.531
Benign Systemic Neoplasm		--	--	--	(n=1,607)	(n=616)	
	Yes				16.1%	15.6%	0.836
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature		--	--	--	(n=1,607)	(n=616)	
	Yes				1.7%	1.5%	0.780
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck		--	--	--	(n=1,607)	(n=616)	
	Yes				0.9%	0.8%	0.983
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx		--	--	--	(n=1,607)	(n=616)	
	Yes				0.4%	0.5%	0.999

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

<b>Dependent Variable</b>	<b>Level</b>	<b>Ionizing Radiation Exposure</b>			<b>Industrial Chemical Exposure</b>		
		<b>No</b>	<b>Yes</b>	<b>p-Value</b>	<b>No</b>	<b>Yes</b>	<b>p-Value</b>
Any Skin Neoplasm	(n=1,588)	(n=496)			(n=868)	(n=1,216)	
	Yes 28.6%	32.9%	0.078		30.3%	29.1%	0.591
Malignant Skin Neoplasm	(n=1,588)	(n=496)			(n=868)	(n=1,216)	
	Yes 12.0%	14.5%	0.168		13.7%	11.8%	0.231
Benign Skin Neoplasm	(n=1,674)	(n=540)			(n=915)	(n=1,299)	
	Yes 17.9%	20.4%	0.214		18.8%	18.2%	0.784
Skin Neoplasm of Uncertain Behavior or Unspecified Nature	(n=1,588)	(n=496)			(n=868)	(n=1,216)	
	Yes 0.6%	0.4%	0.933		0.5%	0.6%	0.960
Any Basal Cell Carcinoma	(n=1,588)	(n=496)			(n=868)	(n=1,216)	
	Yes 10.1%	12.5%	0.149		11.5%	10.0%	0.311
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck	(n=1,588)	(n=496)			(n=868)	(n=1,216)	
	Yes 7.9%	10.1%	0.145		9.1%	7.9%	0.369
Basal Cell Carcinoma on Trunk	(n=1,588)	(n=496)			(n=868)	(n=1,216)	
	Yes 3.1%	3.6%	0.650		3.9%	2.7%	0.159
Basal Cell Carcinoma on Upper Extremities	(n=1,588)	(n=496)			(n=868)	(n=1,216)	
	Yes 1.8%	1.6%	0.905		2.0%	1.6%	0.714
Basal Cell Carcinoma on Lower Extremities	(n=1,588)	(n=496)			(n=868)	(n=1,216)	
	Yes 0.3%	0.0%	0.595		0.0%	0.3%	0.237
Squamous Cell Carcinoma	(n=1,588)	(n=496)			(n=868)	(n=1,216)	
	Yes 1.1%	1.6%	0.543		1.6%	1.0%	0.285
Nonmelanoma	(n=1,588)	(n=496)			(n=868)	(n=1,216)	
	Yes 11.3%	13.7%	0.166		13.3%	10.9%	0.110
Melanoma	(n=1,588)	(n=496)			(n=868)	(n=1,216)	
	Yes 1.0%	1.0%	0.999		0.6%	1.3%	0.149
Any Systemic Neoplasm	(n=1,677)	(n=546)			(n=918)	(n=1,305)	
	Yes 20.6%	21.1%	0.877		23.9%	18.5%	0.003
Malignant Systemic Neoplasm	(n=1,677)	(n=546)			(n=918)	(n=1,305)	
	Yes 4.2%	5.7%	0.200		5.8%	3.8%	0.033
Benign Systemic Neoplasm	(n=1,677)	(n=546)			(n=918)	(n=1,305)	
	Yes 16.2%	15.2%	0.642		18.3%	14.3%	0.012
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature	(n=1,677)	(n=546)			(n=918)	(n=1,305)	
	Yes 1.6%	2.0%	0.586		2.0%	1.5%	0.455
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck	(n=1,677)	(n=546)			(n=918)	(n=1,305)	
	Yes 0.8%	1.1%	0.759		1.1%	0.8%	0.571
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx	(n=1,677)	(n=546)			(n=918)	(n=1,305)	
	Yes 0.3%	0.9%	0.132		0.5%	0.4%	0.812

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Herbicide Exposure			Insecticide Exposure		
		No	Yes	p-Value	No	Yes	p-Value
Any Skin Neoplasm	(n=786)	(n=1,298)			(n=650)	(n=1,434)	
	Yes	27.5%	30.9%	0.109	28.5%	30.1%	0.472
Malignant Skin Neoplasm	(n=786)	(n=1,298)			(n=650)	(n=1,434)	
	Yes	11.5%	13.3%	0.237	11.5%	13.1%	0.352
Benign Skin Neoplasm	(n=838)	(n=1,376)			(n=700)	(n=1,514)	
	Yes	17.5%	19.0%	0.409	18.3%	18.6%	0.924
Skin Neoplasm of Uncertain Behavior or Unspecified Nature	(n=786)	(n=1,298)			(n=650)	(n=1,434)	
	Yes	0.6%	0.5%	0.827	0.6%	0.5%	0.964
Any Basal Cell Carcinoma	(n=786)	(n=1,298)			(n=650)	(n=1,434)	
	Yes	9.2%	11.6%	0.100	9.1%	11.4%	0.135
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck	(n=786)	(n=1,298)			(n=650)	(n=1,434)	
	Yes	7.4%	9.0%	0.221	7.4%	8.9%	0.300
Basal Cell Carcinoma on Trunk	(n=786)	(n=1,298)			(n=650)	(n=1,434)	
	Yes	2.4%	3.7%	0.139	2.8%	3.4%	0.520
Basal Cell Carcinoma on Upper Extremities	(n=786)	(n=1,298)			(n=650)	(n=1,434)	
	Yes	1.7%	1.9%	0.876	1.5%	1.9%	0.710
Basal Cell Carcinoma on Lower Extremities	(n=786)	(n=1,298)			(n=650)	(n=1,434)	
	Yes	0.3%	0.2%	0.999	0.0%	0.3%	0.419
Squamous Cell Carcinoma	(n=786)	(n=1,298)			(n=650)	(n=1,434)	
	Yes	1.5%	1.1%	0.490	1.7%	1.1%	0.308
Nonmelanoma	(n=786)	(n=1,298)			(n=650)	(n=1,434)	
	Yes	10.8%	12.5%	0.284	10.8%	12.3%	0.339
Melanoma	(n=786)	(n=1,298)			(n=650)	(n=1,434)	
	Yes	0.8%	1.2%	0.520	1.1%	1.0%	0.999
Any Systemic Neoplasm	(n=839)	(n=1,384)			(n=701)	(n=1,522)	
	Yes	19.3%	21.6%	0.215	20.8%	20.7%	0.988
Malignant Systemic Neoplasm	(n=839)	(n=1,384)			(n=701)	(n=1,522)	
	Yes	4.4%	4.7%	0.835	4.9%	4.5%	0.771
Benign Systemic Neoplasm	(n=839)	(n=1,384)			(n=701)	(n=1,522)	
	Yes	14.5%	16.8%	0.184	15.8%	16.0%	0.987
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature	(n=839)	(n=1,384)			(n=701)	(n=1,522)	
	Yes	1.3%	1.9%	0.399	1.7%	1.6%	0.999
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck	(n=839)	(n=1,384)			(n=701)	(n=1,522)	
	Yes	0.7%	1.0%	0.627	0.9%	0.9%	0.999
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx	(n=839)	(n=1,384)			(n=701)	(n=1,522)	
	Yes	0.4%	0.5%	0.858	0.4%	0.5%	0.999

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

<b>Dependent Variable</b>	<b>Level</b>	<b>Degreasng Chemical Exposure</b>		
		<b>No</b>	<b>Yes</b>	<b>p-Value</b>
Any Skin Neoplasm		(n=770)	(n=1,314)	
	Yes	30.9%	28.8%	0.343
Malignant Skin Neoplasm		(n=770)	(n=1,314)	
	Yes	14.4%	11.6%	0.069
Benign Skin Neoplasm		(n=820)	(n=1,394)	
	Yes	18.4%	18.5%	0.999
Skin Neoplasm of Uncertain Behavior or Unspecified Nature		(n=770)	(n=1,314)	
	Yes	0.4%	0.6%	0.724
Any Basal Cell Carcinoma		(n=770)	(n=1,314)	
	Yes	11.6%	10.1%	0.341
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck		(n=770)	(n=1,314)	
	Yes	9.0%	8.1%	0.530
Basal Cell Carcinoma on Trunk		(n=770)	(n=1,314)	
	Yes	3.9%	2.8%	0.222
Basal Cell Carcinoma on Upper Extremities		(n=770)	(n=1,314)	
	Yes	2.0%	1.7%	0.776
Basal Cell Carcinoma on Lower Extremities		(n=770)	(n=1,314)	
	Yes	0.1%	0.2%	0.999
Squamous Cell Carcinoma		(n=770)	(n=1,314)	
	Yes	1.7%	1.0%	0.237
Nonmelanoma		(n=770)	(n=1,314)	
	Yes	13.4%	11.0%	0.115
Melanoma		(n=770)	(n=1,314)	
	Yes	1.3%	0.8%	0.429
Any Systemic Neoplasm		(n=822)	(n=1,401)	
	Yes	22.0%	20.0%	0.277
Malignant Systemic Neoplasm		(n=822)	(n=1,401)	
	Yes	5.4%	4.1%	0.255
Benign Systemic Neoplasm		(n=822)	(n=1,401)	
	Yes	16.3%	15.7%	0.755
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature		(n=822)	(n=1,401)	
	Yes	2.2%	1.4%	0.190
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck		(n=822)	(n=1,401)	
	Yes	1.1%	0.8%	0.607
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx		(n=822)	(n=1,401)	
	Yes	0.5%	0.4%	0.999

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Lifetime Cigarette Smoking History (Pack-years)			p-Value
		0	>0-10	>10	
Any Skin Neoplasm		--	--	--	--
Malignant Skin Neoplasm		--	--	--	--
Benign Skin Neoplasm		--	--	--	--
Skin Neoplasm of Uncertain Behavior or Unspecified Nature		--	--	--	--
Any Basal Cell Carcinoma		--	--	--	--
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck		--	--	--	--
Basal Cell Carcinoma on Trunk		--	--	--	--
Basal Cell Carcinoma on Upper Extremities		--	--	--	--
Basal Cell Carcinoma on Lower Extremities		--	--	--	--
Squamous Cell Carcinoma		--	--	--	--
Nonmelanoma		--	--	--	--
Melanoma		--	--	--	--
Any Systemic Neoplasm	Yes	(n=608) 19.7%	(n=680) 18.1%	(n=932) 23.3%	0.031
Malignant Systemic Neoplasm	Yes	(n=608) 4.3%	(n=680) 2.7%	(n=932) 6.2%	0.003
Benign Systemic Neoplasm	Yes	(n=608) 15.6%	(n=680) 15.4%	(n=932) 16.5%	0.815
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature	Yes	(n=608) 1.2%	(n=680) 1.5%	(n=932) 2.0%	0.376
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck	Yes	(n=608) 0.7%	(n=680) 0.4%	(n=932) 1.4%	0.102
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx	Yes	(n=608) 0.3%	(n=680) 0.2%	(n=932) 0.8%	0.176

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Lifetime Alcohol History (Drink-years)			p-Value
		0	>0-40	>40	
Any Skin Neoplasm		--	--	--	--
Malignant Skin Neoplasm		--	--	--	--
Benign Skin Neoplasm		--	--	--	--
Skin Neoplasm of Uncertain Behavior or Unspecified Nature		--	--	--	--
Any Basal Cell Carcinoma		--	--	--	--
Basal Cell Carcinoma on Eye, Ear, Face, Head, or Neck		--	--	--	--
Basal Cell Carcinoma on Trunk		--	--	--	--
Basal Cell Carcinoma on Upper Extremities		--	--	--	--
Basal Cell Carcinoma on Lower Extremities		--	--	--	--
Squamous Cell Carcinoma		--	--	--	--
Nonmelanoma		--	--	--	--
Melanoma		--	--	--	--
Any Systemic Neoplasm	Yes	(n=134) 20.2%	(n=1,487) 19.9%	(n=560) 21.4%	0.746
Malignant Systemic Neoplasm	Yes	(n=134) 2.2%	(n=1,487) 4.3%	(n=560) 5.5%	0.209
Benign Systemic Neoplasm	Yes	(n=134) 19.4%	(n=1,487) 15.1%	(n=560) 16.1%	0.405
Systemic Neoplasm of Uncertain Behavior or Unspecified Nature	Yes	(n=134) 0.0%	(n=1,487) 1.8%	(n=560) 1.6%	0.304
Malignant Systemic Neoplasm of Eye, Ear, Face, Head, or Neck	Yes	(n=134) 1.5%	(n=1,487) 0.8%	(n=560) 1.1%	0.659
Malignant Systemic Neoplasm of Oral Cavity, Pharynx, or Larynx	Yes	(n=134) 0.8%	(n=1,487) 0.3%	(n=560) 0.7%	0.465

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Age			Race		
		Born ≥ 1942	Born < 1942	p-Value	Black	Non-Black	p-Value
Malignant Systemic Neoplasm of Esophagus	Yes	(n=954) 0.0%	(n=1,269) 0.1%	0.999	(n=130) 0.0%	(n=2,093) 0.1%	0.999
Malignant Systemic Neoplasm of Brain	Yes	(n=954) 0.0%	(n=1,269) 0.2%	0.609	(n=130) 0.0%	(n=2,093) 0.1%	0.999
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	Yes	(n=954) 0.2%	(n=1,269) 0.0%	0.359	(n=130) 0.0%	(n=2,093) 0.1%	0.999
Malignant Systemic Neoplasm of Thyroid Gland	Yes	(n=954) 0.0%	(n=1,269) 0.3%	0.219	(n=130) 0.0%	(n=2,093) 0.2%	0.999
Malignant Systemic Neoplasm of Bronchus or Lung	Yes	(n=954) 0.1%	(n=1,269) 0.7%	0.074	(n=130) 0.0%	(n=2,093) 0.5%	0.909
Malignant Systemic Neoplasm of Colon or Rectum	Yes	(n=954) 0.3%	(n=1,269) 0.5%	0.807	(n=130) 0.0%	(n=2,093) 0.4%	0.970
Malignant Systemic Neoplasm of Kidney or Bladder	Yes	(n=954) 0.2%	(n=1,269) 0.7%	0.175	(n=130) 0.8%	(n=2,093) 0.5%	0.999
Malignant Systemic Neoplasm of Prostate	Yes	(n=954) 0.1%	(n=1,269) 3.0%	<0.001	(n=130) 2.3%	(n=2,093) 1.7%	0.880
Malignant Systemic Neoplasm of Testicles	Yes	(n=954) 0.0%	(n=1,269) 0.2%	0.358	(n=130) 0.0%	(n=2,093) 0.1%	0.999
Malignant Systemic Neoplasm of Ill-Defined Sites	Yes	(n=954) 0.0%	(n=1,269) 0.3%	0.219	(n=130) 0.0%	(n=2,093) 0.2%	0.999
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	Yes	(n=954) 0.1%	(n=1,269) 0.1%	0.999	(n=130) 0.0%	(n=2,093) 0.1%	0.999
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	Yes	(n=954) 0.1%	(n=1,269) 0.1%	0.999	(n=130) 0.0%	(n=2,093) 0.1%	0.999
Hodgkin's Disease	Yes	(n=954) 0.0%	(n=1,269) 0.2%	0.609	(n=130) 0.0%	(n=2,093) 0.1%	0.999
Leukemia	Yes	(n=954) 0.1%	(n=1,269) 0.1%	0.999	(n=130) 0.0%	(n=2,093) 0.1%	0.999
Non-Hodgkin's Lymphoma	Yes	(n=954) 0.1%	(n=1,269) 0.3%	0.559	(n=130) 0.0%	(n=2,093) 0.2%	0.999
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	Yes	(n=954) 0.0%	(n=1,269) 0.2%	0.609	(n=130) 0.0%	(n=2,093) 0.1%	0.999
Multiple Myeloma	Yes	(n=954) 0.1%	(n=1,269) 0.0%	0.886	(n=130) 0.0%	(n=2,093) 0.1%	0.999
Any Skin or Systemic Neoplasm	Yes	(n=949) 35.0%	(n=1,255) 48.8%	<0.001	(n=129) 34.9%	(n=2,075) 43.4%	0.072
Prostate-Specific Antigen (continuous - ng/ml) <sup>d</sup>	ASL	(n=2,163) $r=0.299$		<0.001	(n=128) $\bar{x}=1.094$	(n=2,034) $\bar{x}=1.015$	0.336
(discrete)	BSL	2.1%	3.2%	0.166	1.5%	2.8%	0.573
(discrete)	Abnormal	1.1%	6.8%	<0.001	9.2%	4.0%	0.009

<sup>d</sup> Analysis based on natural logarithm of prostate-specific antigen for measurements at or above sensitivity level; means transformed from natural logarithm of prostate-specific antigen scale.

Note: ASL - At or above sensitivity limit.

BSL - Below sensitivity limit.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Occupation			p-Value
		Officer	Enlisted Flyer	Enlisted Groundcrew	
Malignant Systemic Neoplasm of Esophagus	Yes	(n=863) 0.0%	(n=363) 0.3%	(n=997) 0.0%	0.077
Malignant Systemic Neoplasm of Brain	Yes	(n=863) 0.1%	(n=363) 0.3%	(n=997) 0.0%	0.309
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	Yes	(n=863) 0.1%	(n=363) 0.0%	(n=997) 0.1%	0.817
Malignant Systemic Neoplasm of Thyroid Gland	Yes	(n=863) 0.4%	(n=363) 0.0%	(n=997) 0.1%	0.308
Malignant Systemic Neoplasm of Bronchus or Lung	Yes	(n=863) 0.6%	(n=363) 0.8%	(n=997) 0.2%	0.240
Malignant Systemic Neoplasm of Colon or Rectum	Yes	(n=863) 0.7%	(n=363) 0.6%	(n=997) 0.1%	0.117
Malignant Systemic Neoplasm of Kidney or Bladder	Yes	(n=863) 0.9%	(n=363) 0.3%	(n=997) 0.2%	0.068
Malignant Systemic Neoplasm of Prostate	Yes	(n=863) 2.9%	(n=363) 2.7%	(n=997) 0.6%	0.001
Malignant Systemic Neoplasm of Testicles	Yes	(n=863) 0.1%	(n=363) 0.3%	(n=997) 0.1%	0.725
Malignant Systemic Neoplasm of Ill-Defined Sites	Yes	(n=863) 0.2%	(n=363) 0.3%	(n=997) 0.1%	0.717
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	Yes	(n=863) 0.1%	(n=363) 0.0%	(n=997) 0.1%	0.817
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	Yes	(n=863) 0.1%	(n=363) 0.0%	(n=997) 0.1%	0.817
Hodgkin's Disease	Yes	(n=863) 0.2%	(n=363) 0.0%	(n=997) 0.0%	0.207
Leukemia	Yes	(n=863) 0.0%	(n=363) 0.3%	(n=997) 0.1%	0.336
Non-Hodgkin's Lymphoma	Yes	(n=863) 0.4%	(n=363) 0.3%	(n=997) 0.1%	0.519
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	Yes	(n=863) 0.1%	(n=363) 0.0%	(n=997) 0.1%	0.817
Multiple Myeloma	Yes	(n=863) 0.0%	(n=363) 0.0%	(n=997) 0.1%	0.541
Any Skin or Systemic Neoplasm	Yes	(n=854) 47.1%	(n=360) 45.3%	(n=990) 38.4%	0.001
Prostate-Specific Antigen (continuous - ng/ml) <sup>d</sup>	ASL	(n=834) $\bar{x}=1.123$	(n=355) $\bar{x}=1.121$	(n=973) $\bar{x}=0.901$	<0.001
(discrete)	BSL	(n=863) 3.4%	(n=362) 1.9%	(n=997) 2.4%	0.277
(discrete)	Abnormal	(n=863) 5.5%	(n=362) 6.1%	(n=997) 2.1%	0.003

<sup>d</sup> Analysis based on natural logarithm of prostate-specific antigen for measurements at or above sensitivity level; means transformed from natural logarithm of prostate-specific antigen scale.

Note: ASL - At or above sensitivity limit.

BSL - Below sensitivity limit.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Skin Color <sup>a</sup>			Hair Color		
		Non-Peach	Peach	p-Value	Black or Dark Brown	Other <sup>b</sup>	p-Value
Malignant Systemic Neoplasm of Esophagus	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Brain	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Thyroid Gland	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Bronchus or Lung	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Colon or Rectum	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Kidney or Bladder	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Prostate	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Testicles	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Ill-Defined Sites	--	--	--	--	--	--	--
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	--	--	--	--	--	--	--
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	--	--	--	--	--	--	--
Hodgkin's Disease	--	--	--	--	--	--	--
Leukemia	--	--	--	--	--	--	--
Non-Hodgkin's Lymphoma	--	--	--	--	--	--	--
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	--	--	--	--	--	--	--
Multiple Myeloma	--	--	--	--	--	--	--
Any Skin or Systemic Neoplasm	Yes	(n=551) 37.0%	(n=1,647) 44.7%	0.002	(n=1,545) 41.6%	(n=654) 45.7%	0.079
Prostate-Specific Antigen (continuous - ng/ml)	--	--	--	--	--	--	--
(discrete)	--	--	--	--	--	--	--
(discrete)	--	--	--	--	--	--	--

<sup>a</sup> Non-Peach = Dark, medium, or pale skin.

Peach = Dark peach or pale peach skin.

<sup>b</sup> Other = Bald, light brown, blonde, or red hair.

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Eye Color			p-Value
		Brown	Hazel or Green	Gray or Blue	
Malignant Systemic Neoplasm of Esophagus	--	--	--	--	--
Malignant Systemic Neoplasm of Brain	--	--	--	--	--
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	--	--	--	--	--
Malignant Systemic Neoplasm of Thyroid Gland	--	--	--	--	--
Malignant Systemic Neoplasm of Bronchus or Lung	--	--	--	--	--
Malignant Systemic Neoplasm of Colon or Rectum	--	--	--	--	--
Malignant Systemic Neoplasm of Kidney or Bladder	--	--	--	--	--
Malignant Systemic Neoplasm of Prostate	--	--	--	--	--
Malignant Systemic Neoplasm of Testicles	--	--	--	--	--
Malignant Systemic Neoplasm of Ill-Defined Sites	--	--	--	--	--
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	--	--	--	--	--
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	--	--	--	--	--
Hodgkin's Disease	--	--	--	--	--
Leukemia	--	--	--	--	--
Non-Hodgkin's Lymphoma	--	--	--	--	--
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	--	--	--	--	--
Multiple Myeloma	--	--	--	--	--
Any Skin or Systemic Neoplasm	Yes	(n=740) 38.0%	(n=564) 46.1%	(n=892) 44.6%	0.005
Prostate-Specific Antigen (continuous - ng/ml)	--	--	--	--	--
(discrete)	--	--	--	--	--
(discrete)	--	--	--	--	--

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Skin Reaction to Sun after at Least 2 Hours Exposure					p-Value
		No Reaction	Becomes Red	Burns	Painfully Burns		
Malignant Systemic Neoplasm of Esophagus		--	--	--	--	--	--
Malignant Systemic Neoplasm of Brain		--	--	--	--	--	--
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum		--	--	--	--	--	--
Malignant Systemic Neoplasm of Thyroid Gland		--	--	--	--	--	--
Malignant Systemic Neoplasm of Bronchus or Lung		--	--	--	--	--	--
Malignant Systemic Neoplasm of Colon or Rectum		--	--	--	--	--	--
Malignant Systemic Neoplasm of Kidney or Bladder		--	--	--	--	--	--
Malignant Systemic Neoplasm of Prostate		--	--	--	--	--	--
Malignant Systemic Neoplasm of Testicles		--	--	--	--	--	--
Malignant Systemic Neoplasm of Ill-Defined Sites		--	--	--	--	--	--
Malignant Systemic Neoplasm of Connective and Other Soft Tissues		--	--	--	--	--	--
Carcinoma in Situ of the Penis, Other, and Unspecified Sites		--	--	--	--	--	--
Hodgkin's Disease		--	--	--	--	--	--
Leukemia		--	--	--	--	--	--
Non-Hodgkin's Lymphoma		--	--	--	--	--	--
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue		--	--	--	--	--	--
Multiple Myeloma		--	--	--	--	--	--
Any Skin or Systemic Neoplasm	Yes	(n=902) 39.9%	(n=842) 44.5%	(n=308) 43.2%	(n=147) 50.0%		0.073
Prostate-Specific Antigen (continuous - ng/ml)		--	--	--	--	--	--
(discrete)		--	--	--	--	--	--
(discrete)		--	--	--	--	--	--

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Skin Reaction to Sun after Repeated Exposures				p-Value
		Deeply Tanned	Moderately Tanned	Mildly Tanned	Freckled-No Tan	
Malignant Systemic Neoplasm of Esophagus	--	--	--	--	--	--
Malignant Systemic Neoplasm of Brain	--	--	--	--	--	--
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	--	--	--	--	--	--
Malignant Systemic Neoplasm of Thyroid Gland	--	--	--	--	--	--
Malignant Systemic Neoplasm of Bronchus or Lung	--	--	--	--	--	--
Malignant Systemic Neoplasm of Colon or Rectum	--	--	--	--	--	--
Malignant Systemic Neoplasm of Kidney or Bladder	--	--	--	--	--	--
Malignant Systemic Neoplasm of Prostate	--	--	--	--	--	--
Malignant Systemic Neoplasm of Testicles	--	--	--	--	--	--
Malignant Systemic Neoplasm of Ill-Defined Sites	--	--	--	--	--	--
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	--	--	--	--	--	--
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	--	--	--	--	--	--
Hodgkin's Disease	--	--	--	--	--	--
Leukemia	--	--	--	--	--	--
Non-Hodgkin's Lymphoma	--	--	--	--	--	--
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	--	--	--	--	--	--
Multiple Myeloma	--	--	--	--	--	--
Any Skin or Systemic Neoplasm	Yes	(n=667) 38.8%	(n=1,109) 43.6%	(n=365) 46.3%	(n=46) 45.7%	0.089
Prostate-Specific Antigen (continuous - ng/ml)	--	--	--	--	--	--
(discrete)	--	--	--	--	--	--
(discrete)	--	--	--	--	--	--

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Composite Sun Reaction Index <sup>c</sup>			p-Value
		Low	Medium	High	
Malignant Systemic Neoplasm of Esophagus	--	--	--	--	--
Malignant Systemic Neoplasm of Brain	--	--	--	--	--
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	--	--	--	--	--
Malignant Systemic Neoplasm of Thyroid Gland	--	--	--	--	--
Malignant Systemic Neoplasm of Bronchus or Lung	--	--	--	--	--
Malignant Systemic Neoplasm of Colon or Rectum	--	--	--	--	--
Malignant Systemic Neoplasm of Kidney or Bladder	--	--	--	--	--
Malignant Systemic Neoplasm of Prostate	--	--	--	--	--
Malignant Systemic Neoplasm of Testicles	--	--	--	--	--
Malignant Systemic Neoplasm of Ill-Defined Sites	--	--	--	--	--
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	--	--	--	--	--
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	--	--	--	--	--
Hodgkin's Disease	--	--	--	--	--
Leukemia	--	--	--	--	--
Non-Hodgkin's Lymphoma	--	--	--	--	--
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	--	--	--	--	--
Multiple Myeloma	--	--	--	--	--
Any Skin or Systemic Neoplasm	Yes	(n=1,554) 42.1%	(n=475) 43.2%	(n=171) 48.5%	0.266
Prostate-Specific Antigen (continuous - ng/ml)	--	--	--	--	--
(discrete)	--	--	--	--	--
(discrete)	--	--	--	--	--

<sup>c</sup> Low = Painfully burns after at least 2 hours exposure or freckles with no tan after repeated exposures.

Medium = Burns after at least 2 hours exposure or mildly tans after repeated exposures.

High = All other reactions.

--: Covariate not applicable for dependent variable.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Average Lifetime Residential Latitude			Asbestos Exposure		
		<37°	≥37°	p-Value	No	Yes	p-Value
Malignant Systemic Neoplasm of Esophagus	Yes	--	--	--	(n=1,607) 0.0%	(n=616) 0.2%	0.618
Malignant Systemic Neoplasm of Brain	Yes	--	--	--	(n=1,607) 0.1%	(n=616) 0.0%	0.932
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	Yes	--	--	--	(n=1,607) 0.1%	(n=616) 0.2%	0.999
Malignant Systemic Neoplasm of Thyroid Gland	Yes	--	--	--	(n=1,607) 0.3%	(n=616) 0.0%	0.496
Malignant Systemic Neoplasm of Bronchus or Lung	Yes	--	--	--	(n=1,607) 0.4%	(n=616) 0.5%	0.999
Malignant Systemic Neoplasm of Colon or Rectum	Yes	--	--	--	(n=1,607) 0.4%	(n=616) 0.5%	0.996
Malignant Systemic Neoplasm of Kidney or Bladder	Yes	--	--	--	(n=1,607) 0.6%	(n=616) 0.3%	0.711
Malignant Systemic Neoplasm of Prostate	Yes	--	--	--	(n=1,607) 2.0%	(n=616) 1.1%	0.233
Malignant Systemic Neoplasm of Testicles	Yes	--	--	--	(n=1,607) 0.1%	(n=616) 0.2%	0.999
Malignant Systemic Neoplasm of Ill-Defined Sites	Yes	--	--	--	(n=1,607) 0.0%	(n=616) 0.2%	0.999
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	Yes	--	--	--	(n=1,607) 0.1%	(n=616) 0.2%	0.999
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	Yes	--	--	--	(n=1,607) 0.1%	(n=616) 0.2%	0.999
Hodgkin's Disease	Yes	--	--	--	(n=1,607) 0.1%	(n=616) 0.0%	0.932
Leukemia	Yes	--	--	--	(n=1,607) 0.1%	(n=616) 0.0%	0.932
Non-Hodgkin's Lymphoma	Yes	--	--	--	(n=1,607) 0.3%	(n=616) 0.2%	0.999
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	Yes	--	--	--	(n=1,607) 0.1%	(n=616) 0.0%	0.932
Multiple Myeloma	Yes	--	--	--	(n=1,607) 0.0%	(n=616) 0.2%	0.999
Any Skin or Systemic Neoplasm	Yes	(n=1,077) 44.5%	(n=1,104) 41.5%	0.172	(n=1,592) 42.9%	(n=612) 42.8%	0.999
Prostate-Specific Antigen (continuous - ng/ml) <sup>d</sup>	ASL	--	--	--	(n=1,558) $\bar{x}=1.021$	(n=604) $\bar{x}=1.017$	0.928
(discrete)	BSL	--	--	--	(n=1,606) 3.0%	(n=616) 2.0%	0.227
(discrete)	Abnormal	--	--	--	(n=1,606) 4.4%	(n=616) 4.1%	0.795

<sup>d</sup> Analysis based on natural logarithm of prostate-specific antigen for measurements at or above sensitivity level; means transformed from natural logarithm at prostate-specific antigen scale.

--: Covariate not applicable for dependent variable.

Note: ASL - At or above sensitivity limit.

BSL - Below sensitivity limit.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Ionizing Radiation Exposure			Industrial Chemical Exposure		
		No	Yes	p-Value	No	Yes	p-Value
Malignant Systemic Neoplasm of Esophagus	Yes	(n=1,677) 0.1%	(n=546) 0.0%	0.999	(n=918) 0.1%	(n=1,305) 0.0%	0.860
Malignant Systemic Neoplasm of Brain	Yes	(n=1,677) 0.1%	(n=546) 0.0%	0.999	(n=918) 0.2%	(n=1,305) 0.0%	0.333
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	Yes	(n=1,677) 0.1%	(n=546) 0.2%	0.988	(n=918) 0.0%	(n=1,305) 0.2%	0.640
Malignant Systemic Neoplasm of Thyroid Gland	Yes	(n=1,677) 0.2%	(n=546) 0.0%	0.575	(n=918) 0.1%	(n=1,305) 0.2%	0.877
Malignant Systemic Neoplasm of Bronchus or Lung	Yes	(n=1,677) 0.4%	(n=546) 0.7%	0.442	(n=918) 0.3%	(n=1,305) 0.5%	0.685
Malignant Systemic Neoplasm of Colon or Rectum	Yes	(n=1,677) 0.4%	(n=546) 0.4%	0.999	(n=918) 0.5%	(n=1,305) 0.3%	0.595
Malignant Systemic Neoplasm of Kidney or Bladder	Yes	(n=1,677) 0.4%	(n=546) 0.9%	0.207	(n=918) 0.8%	(n=1,305) 0.3%	0.229
Malignant Systemic Neoplasm of Prostate	Yes	(n=1,677) 1.6%	(n=546) 2.4%	0.273	(n=918) 2.2%	(n=1,305) 1.5%	0.265
Malignant Systemic Neoplasm of Testicles	Yes	(n=1,677) 0.2%	(n=546) 0.0%	0.751	(n=918) 0.0%	(n=1,305) 0.2%	0.386
Malignant Systemic Neoplasm of Ill-Defined Sites	Yes	(n=1,677) 0.2%	(n=546) 0.0%	0.575	(n=918) 0.3%	(n=1,305) 0.1%	0.389
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	Yes	(n=1,677) 0.1%	(n=546) 0.0%	0.999	(n=918) 0.1%	(n=1,305) 0.1%	0.999
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	Yes	(n=1,677) 0.1%	(n=546) 0.2%	0.988	(n=918) 0.0%	(n=1,305) 0.2%	0.640
Hodgkin's Disease	Yes	(n=1,677) 0.1%	(n=546) 0.0%	0.999	(n=918) 0.1%	(n=1,305) 0.1%	0.999
Leukemia	Yes	(n=1,677) 0.1%	(n=546) 0.2%	0.988	(n=918) 0.2%	(n=1,305) 0.0%	0.333
Non-Hodgkin's Lymphoma	Yes	(n=1,677) 0.2%	(n=546) 0.4%	0.777	(n=918) 0.4%	(n=1,305) 0.1%	0.192
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	Yes	(n=1,677) 0.1%	(n=546) 0.2%	0.988	(n=918) 0.2%	(n=1,305) 0.0%	0.333
Multiple Myeloma	Yes	(n=1,677) 0.1%	(n=546) 0.0%	0.999	(n=918) 0.1%	(n=1,305) 0.0%	0.999
Any Skin or Systemic Neoplasm	Yes	(n=1,665) 42.0%	(n=539) 45.5%	0.173	(n=911) 45.7%	(n=1,293) 40.9%	0.031
Prostate-Specific Antigen (continuous - ng/ml) <sup>d</sup>	ASL	(n=1,635) $\bar{x}=0.995$	(n=527) $\bar{x}=1.017$	0.007	(n=895) $\bar{x}=1.054$	(n=1,267) $\bar{x}=0.996$	0.085
(discrete)	BSL	(n=1,676) 2.5%	(n=546) 3.5%	0.253	(n=917) 5.0%	(n=1,305) 2.4%	0.548
(discrete)	Abnormal	(n=1,676) 3.7%	(n=546) 6.2%	0.016	(n=917) 5.0%	(n=1,305) 2.9%	0.213

<sup>d</sup> Analysis based on natural logarithm of prostate-specific antigen for measurements at or above sensitivity level; means transformed from natural logarithm of prostate-specific antigen scale.

Note: ASL - At or above sensitivity limit.

BSL - Below sensitivity limit.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

<b>Dependent Variable</b>	<b>Level</b>	<b>Herbicide Exposure</b>			<b>Insecticide Exposure</b>		
		<b>No</b>	<b>Yes</b>	<b>p-Value</b>	<b>No</b>	<b>Yes</b>	<b>p-Value</b>
Malignant Systemic Neoplasm of Esophagus	Yes	(n=839) 0.1%	(n=1,384) 0.0%	0.800	(n=701) 0.0%	(n=1,522) 0.1%	0.999
Malignant Systemic Neoplasm of Brain	Yes	(n=839) 0.0%	(n=1,384) 0.1%	0.710	(n=701) 0.1%	(n=1,522) 0.1%	0.999
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	Yes	(n=839) 0.0%	(n=1,384) 0.1%	0.710	(n=701) 0.0%	(n=1,522) 0.1%	0.842
Malignant Systemic Neoplasm of Thyroid Gland	Yes	(n=839) 0.2%	(n=1,384) 0.1%	0.999	(n=701) 0.3%	(n=1,522) 0.1%	0.797
Malignant Systemic Neoplasm of Bronchus or Lung	Yes	(n=839) 0.4%	(n=1,384) 0.5%	0.858	(n=701) 0.6%	(n=1,522) 0.4%	0.813
Malignant Systemic Neoplasm of Colon or Rectum	Yes	(n=839) 0.5%	(n=1,384) 0.4%	0.943	(n=701) 0.6%	(n=1,522) 0.3%	0.634
Malignant Systemic Neoplasm of Kidney or Bladder	Yes	(n=839) 0.5%	(n=1,384) 0.5%	0.999	(n=701) 1.0%	(n=1,522) 0.3%	0.049
Malignant Systemic Neoplasm of Prostate	Yes	(n=839) 1.3%	(n=1,384) 2.0%	0.283	(n=701) 1.6%	(n=1,522) 1.8%	0.781
Malignant Systemic Neoplasm of Testicles	Yes	(n=839) 0.0%	(n=1,384) 0.2%	0.451	(n=701) 0.0%	(n=1,522) 0.2%	0.579
Malignant Systemic Neoplasm of Ill-Defined Sites	Yes	(n=839) 0.4%	(n=1,384) 0.1%	0.307	(n=701) 0.3%	(n=1,522) 0.1%	0.797
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	Yes	(n=839) 0.2%	(n=1,384) 0.0%	0.277	(n=701) 0.1%	(n=1,522) 0.1%	0.999
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	Yes	(n=839) 0.1%	(n=1,384) 0.1%	0.999	(n=701) 0.1%	(n=1,522) 0.1%	0.999
Hodgkin's Disease	Yes	(n=839) 0.1%	(n=1,384) 0.1%	0.999	(n=701) 0.1%	(n=1,522) 0.1%	0.999
Leukemia	Yes	(n=839) 0.1%	(n=1,384) 0.1%	0.999	(n=701) 0.0%	(n=1,522) 0.1%	0.842
Non-Hodgkin's Lymphoma	Yes	(n=839) 0.2%	(n=1,384) 0.2%	0.999	(n=701) 0.1%	(n=1,522) 0.3%	0.941
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	Yes	(n=839) 0.1%	(n=1,384) 0.1%	0.999	(n=701) 0.1%	(n=1,522) 0.1%	0.999
Multiple Myeloma	Yes	(n=839) 0.0%	(n=1,384) 0.1%	0.999	(n=701) 0.0%	(n=1,522) 0.1%	0.999
Any Skin or Systemic Neoplasm	Yes	(n=837) 39.6%	(n=1,367) 44.9%	0.015	(n=698) 41.6%	(n=1,506) 43.5%	0.417
Prostate-Specific Antigen (continuous - ng/ml) <sup>d</sup>	ASL  (discrete)	(n=819) $\bar{x}=1.043$	(n=1,343) $\bar{x}=1.006$	0.286	(n=683) $\bar{x}=1.013$	(n=1,479) $\bar{x}=1.023$	0.722
	BSL  (discrete)	2.4%	2.9%	0.561	2.6%	2.8%	0.904
	Abnormal	4.3%	4.3%	0.957	5.4%	3.8%	0.083

<sup>d</sup> Analysis based on natural logarithm of prostate-specific antigen for measurements at or above sensitivity level; means transformed from natural logarithm of prostate-specific antigen scale.

Note: ASL - At or above sensitivity limit.

BSL - Below sensitivity limit.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Decreasing Chemical Exposure		
		No	Yes	p-Value
Malignant Systemic Neoplasm of Esophagus	Yes	(n=822)	(n=1,401)	
		0.0%	0.1%	0.999
Malignant Systemic Neoplasm of Brain	Yes	(n=822)	(n=1,401)	
		0.2%	0.0%	0.265
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	Yes	(n=822)	(n=1,401)	
		0.0%	0.1%	0.726
Malignant Systemic Neoplasm of Thyroid Gland	Yes	(n=822)	(n=1,401)	
		0.4%	0.1%	0.290
Malignant Systemic Neoplasm of Bronchus or Lung	Yes	(n=822)	(n=1,401)	
		0.2%	0.6%	0.432
Malignant Systemic Neoplasm of Colon or Rectum	Yes	(n=822)	(n=1,401)	
		0.5%	0.4%	0.905
Malignant Systemic Neoplasm of Kidney or Bladder	Yes	(n=822)	(n=1,401)	
		0.7%	0.4%	0.370
Malignant Systemic Neoplasm of Prostate	Yes	(n=822)	(n=1,401)	
		2.2%	1.5%	0.303
Malignant Systemic Neoplasm of Testicles	Yes	(n=822)	(n=1,401)	
		0.1%	0.1%	0.999
Malignant Systemic Neoplasm of Ill-Defined Sites	Yes	(n=822)	(n=1,401)	
		0.2%	0.1%	0.983
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	Yes	(n=822)	(n=1,401)	
		0.1%	0.1%	0.999
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	Yes	(n=822)	(n=1,401)	
		0.1%	0.1%	0.999
Hodgkin's Disease	Yes	(n=822)	(n=1,401)	
		0.1%	0.1%	0.999
Leukemia	Yes	(n=822)	(n=1,401)	
		0.0%	0.1%	0.726
Non-Hodgkin's Lymphoma	Yes	(n=822)	(n=1,401)	
		0.4%	0.1%	0.546
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	Yes	(n=822)	(n=1,401)	
		0.1%	0.1%	0.999
Multiple Myeloma	Yes	(n=822)	(n=1,401)	
		0.0%	0.1%	0.999
Any Skin or Systemic Neoplasm	Yes	(n=817)	(n=1,387)	
		43.3%	42.3%	0.521
Prostate-Specific Antigen (continuous - ng/ml) <sup>d</sup>	ASL	(n=800)	(n=1,362)	
		$\bar{x}=1.045$	$\bar{x}=1.005$	0.254
		(n=822)	(n=1,400)	
(discrete)	BSL	2.6%	2.8%	0.904
		4.7%	4.1%	0.451

<sup>d</sup> Analysis based on natural logarithm of prostate-specific antigen for measurements at or above sensitivity level; means transformed from natural logarithm of prostate-specific antigen scale.

Note: ASL - At or above sensitivity limit.

BSL - Below sensitivity limit.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Lifetime Cigarette Smoking History (Pack-years)			p-Value
		0 (n=608)	>0-10 (n=680)	>10 (n=932)	
Malignant Systemic Neoplasm of Esophagus	Yes	0.0%	0.0%	0.1%	0.501
Malignant Systemic Neoplasm of Brain	Yes	0.0%	0.2%	0.1%	0.662
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	Yes	0.0%	0.0%	0.2%	0.251
Malignant Systemic Neoplasm of Thyroid Gland	Yes	0.3%	0.2%	0.1%	0.587
Malignant Systemic Neoplasm of Bronchus or Lung	Yes	0.0%	0.2%	1.0%	0.008
Malignant Systemic Neoplasm of Colon or Rectum	Yes	0.3%	0.3%	0.5%	0.707
Malignant Systemic Neoplasm of Kidney or Bladder	Yes	0.2%	0.2%	1.0%	0.027
Malignant Systemic Neoplasm of Prostate	Yes	2.0%	1.3%	1.9%	0.586
Malignant Systemic Neoplasm of Testicles	Yes	0.0%	0.0%	0.3%	0.125
Malignant Systemic Neoplasm of Ill-Defined Sites	Yes	0.3%	0.0%	0.2%	0.361
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	Yes	0.0%	0.0%	0.2%	0.251
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	Yes	0.2%	0.2%	0.0%	0.482
Hodgkin's Disease	Yes	0.3%	0.0%	0.0%	0.070
Leukemia	Yes	0.2%	0.2%	0.0%	0.482
Non-Hodgkin's Lymphoma	Yes	0.3%	0.0%	0.3%	0.331
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	Yes	0.2%	0.0%	0.1%	0.601
Multiple Myeloma	Yes	0.0%	0.2%	0.0%	0.322
Any Skin or Systemic Neoplasm	Yes	41.6%	41.8%	44.5%	0.411
Prostate-Specific Antigen (continuous - ng/ml)	ASL		(n=2,160) $r=-0.008$		0.708
(discrete)	BSL	2.3%	(n=607) 2.5%	(n=932) 3.1%	0.588
(discrete)	Abnormal	4.5%	(n=680) 4.9%	(n=932) 3.8%	0.545

<sup>d</sup> Analysis based on natural logarithm of prostate-specific antigen for measurements at or above sensitivity level; means transformed from natural logarithm of prostate-specific antigen scale.

Note: ASL - At or above sensitivity limit.

BSL - Below sensitivity limit.

**Table F-1-1. (Continued)**  
**Dependent Variable-Covariate Associations for the Neoplasia Assessment**

Dependent Variable	Level	Lifetime Alcohol History (Drink-years)			p-Value
		0	>0-40	>40	
Malignant Systemic Neoplasm of Esophagus	Yes	(n=134) 0.0%	(n=1,487) 0.1%	(n=560) 0.0%	0.792
Malignant Systemic Neoplasm of Brain	Yes	(n=134) 0.8%	(n=1,487) 0.0%	(n=560) 0.2%	0.017
Malignant Systemic Neoplasm of Thymus, Heart, or Mediastinum	Yes	(n=134) 0.0%	(n=1,487) 0.1%	(n=560) 0.0%	0.627
Malignant Systemic Neoplasm of Thyroid Gland	Yes	(n=134) 0.0%	(n=1,487) 0.2%	(n=560) 0.2%	0.872
Malignant Systemic Neoplasm of Bronchus or Lung	Yes	(n=134) 0.0%	(n=1,487) 0.5%	(n=560) 0.4%	0.622
Malignant Systemic Neoplasm of Colon or Rectum	Yes	(n=134) 0.0%	(n=1,487) 0.4%	(n=560) 0.5%	0.682
Malignant Systemic Neoplasm of Kidney or Bladder	Yes	(n=134) 0.0%	(n=1,487) 0.3%	(n=560) 1.3%	0.014
Malignant Systemic Neoplasm of Prostate	Yes	(n=134) 0.0%	(n=1,487) 1.6%	(n=560) 2.1%	0.198
Malignant Systemic Neoplasm of Testicles	Yes	(n=134) 0.0%	(n=1,487) 0.2%	(n=560) 0.0%	0.496
Malignant Systemic Neoplasm of Ill-Defined Sites	Yes	(n=134) 0.0%	(n=1,487) 0.3%	(n=560) 0.0%	0.393
Malignant Systemic Neoplasm of Connective and Other Soft Tissues	Yes	(n=134) 0.0%	(n=1,487) 0.1%	(n=560) 0.0%	0.627
Carcinoma in Situ of the Penis, Other, and Unspecified Sites	Yes	(n=134) 0.0%	(n=1,487) 0.1%	(n=560) 0.0%	0.627
Hodgkin's Disease	Yes	(n=134) 0.0%	(n=1,487) 0.1%	(n=560) 0.2%	0.711
Leukemia	Yes	(n=134) 0.8%	(n=1,487) 0.1%	(n=560) 0.0%	0.032
Non-Hodgkin's Lymphoma	Yes	(n=134) 0.0%	(n=1,487) 0.2%	(n=560) 0.4%	0.685
Other Malignant Systemic Neoplasms of Lymphoid and Histiocytic Tissue	Yes	(n=134) 0.0%	(n=1,487) 0.0%	(n=560) 0.4%	0.055
Multiple Myeloma	Yes	(n=134) 0.0%	(n=1,487) 0.1%	(n=560) 0.0%	0.792
Any Skin or Systemic Neoplasm	Yes	(n=132) 37.1%	(n=1,474) 41.6%	(n=566) 46.8%	0.046
Prostate-Specific Antigen (continuous - ng/ml) <sup>d</sup>	ASL		(n=2,124) r=-0.033		0.124
(discrete)	BSL	(n=134) 1.5%	(n=1,486) 2.8%	(n=560) 2.5%	0.666
(discrete)	Abnormal	(n=134) 4.5%	(n=1,486) 4.7%	(n=560) 3.0%	0.245

<sup>d</sup> Analysis based on natural logarithm of prostate-specific antigen for measurements at or above sensitivity level; means transformed from natural logarithm of prostate-specific antigen scale.

Note: ASL - At or above sensitivity limit.  
 BSL - Below sensitivity limit.

**Table F-1-2.**  
**Analysis of Melanoma**  
**Miscoded Non-Black Participant Recoded**  
**Re-Analysis of Table 10-14**

<b>a) MODEL 1: RANCH HANDS VS. COMPARISONS — UNADJUSTED</b>					
<b>Occupational Category</b>	<b>Group</b>	<b>n</b>	<b>Percent Yes</b>	<b>Est. Relative Risk (95% C.I.)</b>	<b>p-Value</b>
<i>All</i>	<i>Ranch Hand Comparison</i>	886 1,199	1.2 0.9	1.36 (0.59,3.15)	0.618
Officer	Ranch Hand Comparison	357 490	1.7 1.0	1.66 (0.50,5.48)	0.596
Enlisted Flyer	Ranch Hand Comparison	150 188	0.0 0.5	--	--
Enlisted Groundcrew	Ranch Hand Comparison	379 521	1.3 1.0	1.38 (0.40,4.80)	0.852

<b>b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED</b>			
<b>Occupational Category</b>	<b>Adj. Relative Risk (95% C.I.)</b>	<b>p-Value</b>	<b>Covariate Remarks<sup>a</sup></b>
<i>All</i>	1.24 (0.53,2.90)	0.613	LAT (p=0.040) IC (p=0.011) DC (p=0.052)
Officer	1.57 (0.47,5.23)	0.460	
Enlisted Flyer	--	--	
Enlisted Groundcrew	1.23 (0.35,4.32)	0.747	

<sup>a</sup> Covariates and associated p-values correspond to final model based on all participants with available data.

--: Relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

**Table F-1-2. (Continued)**  
**Analysis of Melanoma**  
**Miscoded Non-Black Participant Recoded**  
**Re-Analysis of Table 10-14**

<b>c) MODEL 2: RANCH HANDS — INITIAL DIOXIN — UNADJUSTED</b>			
Initial Dioxin Category Summary Statistics		Analysis Results for $\text{Log}_2$ (Initial Dioxin) <sup>a</sup>	
Initial Dioxin	n	Percent Yes	Estimated Relative Risk (95% C.I.) <sup>b</sup>
Low	152	2.0	0.61 (0.30,1.24)
Medium	161	1.2	
High	164	1.2	

  

<b>d) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED</b>			
Analysis Results for $\text{Log}_2$ (Initial Dioxin) <sup>c</sup>			
n	Adj. Relative Risk (95% C.I.) <sup>b</sup>	p-Value	Covariate Remarks
477	0.43 (0.18,0.99)	0.021	SKIN (p=0.047) HAIR (p=0.003) IC (p=0.013) DC (p=0.008)

<sup>a</sup> Adjusted for percent body fat at the time of duty in SEA and change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin.

<sup>b</sup> Relative risk for a twofold increase in initial dioxin.

<sup>c</sup> Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

**Table F-1-2. (Continued)**  
**Analysis of Melanoma**  
**Miscoded Non-Black Participant Recoded**  
**Re-Analysis of Table 10-14**

**e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — UNADJUSTED**

Dioxin Category	n	Percent Yes	Est. Relative Risk (95% C.I.) <sup>ab</sup>	p-Value
Comparison	1,003	0.9		
Background RH	356	0.8	0.94 (0.25,3.51)	0.921
Low RH	232	2.2	2.46 (0.81,7.45)	0.111
High RH	245	0.8	0.90 (0.19,4.23)	0.895
Low plus High RH	477	1.5	1.65 (0.61,4.49)	0.326

**f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED**

Dioxin Category	n	Adj. Relative Risk (95% C.I.) <sup>ac</sup>	p-Value	Covariate Remarks
Comparison	991			LAT (p=0.033) IC (p=0.048) DC (p=0.053)
Background RH	355	0.97 (0.25,3.76)	0.964	
Low RH	230	2.34 (0.74,7.40)	0.148	
High RH	245	0.93 (0.19,4.53)	0.930	
Low plus High RH	475	1.64 (0.58,4.63)	0.351	

<sup>a</sup> Relative risk and confidence interval relative to Comparisons.

<sup>b</sup> Adjusted for percent body fat at the time of duty in SEA and change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin.

<sup>c</sup> Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

**Table F-1-2. (Continued)**  
**Analysis of Melanoma**  
**Miscoded Non-Black Participant Recoded**  
**Re-Analysis of Table 10-14**

<b>g) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — UNADJUSTED</b>					
Model <sup>a</sup>	Current Dioxin Category Percent Yes/(n)			Analysis Results for Log <sub>2</sub> (Current Dioxin + 1) Est. Relative Risk (95% C.I.) <sup>b</sup>	p-Value
	Low	Medium	High		
4	0.7 (281)	2.2 (272)	0.7 (280)	0.98 (0.64,1.50)	0.934
5	1.1 (285)	1.1 (268)	1.4 (280)	0.99 (0.69,1.42)	0.944
6 <sup>c</sup>	1.1 (284)	1.1 (268)	1.4 (280)	1.02 (0.69,1.51)	0.938

  

<b>h) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED</b>				
Model <sup>a</sup>	n	Analysis Results for Log <sub>2</sub> (Current Dioxin + 1)		
		Adj. Relative Risk (95% C.I.) <sup>b</sup>	p-Value	Covariate Remarks
4	830	1.01 (0.64,1.57)	0.982	HAIR (p=0.086) LAT (p=0.019) IC (p=0.130) DC (p=0.044)
5	830	1.01 (0.69,1.48)	0.950	HAIR (p=0.087) LAT (p=0.019) IC (p=0.130) DC (p=0.043)
6 <sup>d</sup>	829	1.03 (0.69,1.54)	0.869	HAIR (p=0.088) LAT (p=0.020) IC (p=0.135) DC (p=0.044)

<sup>a</sup> Model 4: Log<sub>2</sub> (lipid-adjusted current dioxin + 1).

Model 5: Log<sub>2</sub> (whole-weight current dioxin + 1).

Model 6: Log<sub>2</sub> (whole-weight current dioxin + 1), adjusted for log<sub>2</sub> total lipids.

<sup>b</sup> Relative risk for a twofold increase in current dioxin.

<sup>c</sup> Adjusted for log<sub>2</sub> total lipids.

<sup>d</sup> Adjusted for log<sub>2</sub> total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.